APPENDIX A

FILED
United States Court of Appeals
Tenth Circuit
DEC 6, 2004
PATRICK FISHER
Clerk

[As amended on partial grant of rehearing Feb. 9, 2005]

PUBLISH

UNITED STATES COURT OF APPEALS

TENTH CIRCUIT

FRED D. BITLER; PEGGY A. BITLER; COLORADO COMPENSATION INSURANCE AUTHORITY, a political subdivision of the State of Colorado, Plaintiffs – Appellees, v. A.O. SMITH CORPORATION, a foreign corporation; NATIONAL PROPANE CORP., formerly known as All Seasons Propane, a Colorado corporation, Defendants,	No. 02-1527

and

WHITE RODGERS, a subsidiary of EMERSON ELECTRIC CORP., a foreign corporation,

Defendant – Appellant.

Appeal from the United States District Court for the District of Colorado (D.C. Nos. 98-N-1897 and 98-BB-1897)

Daniel A. Nelson (Bruce A. Lampert, with him on the briefs), Schaden, Katzman, Lampert & McClune, Broomfield, Colorado, for Plaintiffs-Appellees Fred and Peggy Bitler.

Andrew M. Low (Peter J. Krumholz, with him on the briefs), Davis, Graham & Stubbs LLP, Denver, Colorado, for Defendant-Appellant.

Before **LUCERO**, **McKAY** and **HARTZ**, Circuit Judges.

LUCERO, Circuit Judge.

Danger lurked in Fred and Peggy Bitler's basement, liability for which is the occasion for the present appeal. Mr. Bitler was severely burned when a gas explosion occurred in the basement of his home. On filing a products liability suit against, inter alia, White-Rodgers as manufacturer of the gas control installed in his basement water heater, a jury returned a verdict finding negligence and product defect and awarded damages to the Bitlers. White-Rodgers' motions for JNOV and a new trial having been denied by the district court, the present appeal followed. In contesting the jury verdict im-

posing products liability on it for the explosion, White-Rodgers assigns as principal error the district court's admission of plaintiffs' expert testimony under *Daubert* principles. We exercise jurisdiction under 28 U.S.C. § 1291 and **AFFIRM**.

I

Fred and Peggy Bitler resided in a house provided for their use on the Oldland Ranch outside of Meeker, Colorado where Fred Bitler was a ranch hand. On the evening of the accident, July 25, 1996, Bitler discovered that there was no hot water when he attempted to shower. Hot water was supplied to the Bitlers' home by a liquid propane hot water heater located in the basement. Donning sweat pants, he proceeded to the basement door, unlatched it, and walked approximately two-third's of the way down the staircase when a large explosion occurred, knocking him backwards. His wife, Peggy Bitler, was thrown off a sofa and onto the floor, which was later determined to have been raised several inches by the force of the explosion. Fred Bitler sustained severe burns, and after being flown by helicopter to a hospital, underwent multiple skin graft surgeries over the following weeks. It was established at trial that he has, in addition to general disfigurement, continuing problems with regulation of his body temperature, use of his hands, growth of hair follicles, and he will also need additional procedures in the future to develop nail growth on his hands. As a result of the injuries he sustained in this accident, he is no longer able to perform the duties appertaining to his former occupation as a cowboy and ranch hand.

There were three gas propane appliances in the Bitlers' home—a cook stove in the kitchen, a furnace in a bedroom, and a space heater in one of the bedrooms. Gas was supplied to the water heater via unsupported, flexible copper tubing that ran along the basement ceiling joints. A "T-fitting" was located above the hot water heater which provided branches

running to the hot water heater and the space heater. Post-accident inspection revealed a minor leak at the inlet to the bedroom heater, and a leak at the "T-connector."

White-Rodgers, a subdivision of Emerson Electric Co., manufactured the water heater gas control used in the Bitlers' hot water heater. This gas control regulates the flow of gas to the pilot and main burner of the water heater, and is designed to fulfill a crucial safety role if the pilot light is extinguished. To avoid a gas leak that could lead to an explosion or fire, the gas control is designed to shut off all gas flow to the pilot when the pilot is extinguished. As is well known, a lit pilot heats a thermocouple which in turn creates an electric current energizing an electromagnet that holds the safety valve open against the force of a spring. So long as the pilot is lit, the safety valve remains open. If the pilot goes out, however, the thermocouple will no longer be heated and will no longer produce a current to energize the electromagnet, allowing the spring to snap the valve shut. The safety valve seat is made of rubber, and is designed to create a seal against a circular metal surface when closed to prevent the flow of gas to the pilot.

Copper sulfide is a frequent contaminate found in gas and propane lines. If copper sulfide particles of sufficient size become lodged on a safety valve seat when a pilot is extinguished, the particles may prevent the valve from sealing, resulting in a gas leak. It was established that numerous accidents have occurred in this manner, and that copper sulfide contamination was a significant source of concern for White-Rodgers. As a consequence, White-Rodgers modified the design of the safety valve in 1978 and began installing a wire mesh screen in the gas inlet, upstream from the safety valve to prevent copper sulfide particles from migrating onto the rubber valve seat. In further recognition of the safety hazard caused by copper sulfide contamination, White-Rodgers recalled all gas controls lacking the mesh screen in 1980.

Thereafter, White-Rodgers also began adding another safety feature to the mesh screen by installing a deflection "baffle" to aid in preventing debris from reaching the valve and to hold the edges of the mesh screen in place more effectively. The safety valve installed in the Bitler's water heater was one of about 200,000 devices produced in the interim that contained the mesh screen, but did not contain the baffle.

As a result of their investigations, plaintiffs' expert Elden Boh concluded that the water heater was the source of the accident, and plaintiffs' expert Donald Sommer concluded that the leak was caused by copper sulfide contamination on the water heater's safety valve seat. Elden Boh is a fire investigator hired by the Colorado Farm Bureau, and Donald Sommer is an engineer and accident investigator retained by the Bitlers. Although White-Rodgers contests the admissibility of these two experts on appeal, plaintiffs' expert W. Alan Bullerdiek, a chemical engineer, also testified concerning the history of copper sulfide-contamination-related accidents, and that the amount of contamination found on the Bitlers' safety valve seat was at an unacceptable level.

During post-accident testing of the safety valve installed in the Bitlers' water heater, the device was disassembled in the presence of representatives of both White-Rodgers and the Bitlers. Copper sulfide particulate contamination was discovered downstream of the mesh screen and found on the safety valve seat. During the teardown, a test of the valve revealed that it snapped shut as designed. Plaintiffs' expert, Donald Sommer, opined at trial that a mix of copper sulfide particles and grease located on the safety valve seat caused the leak. Mr. Sommer testified that the valve seat was altered after the accident when the control was turned to the "off" position; furthermore, he testified that because copper sulfide contamination leads to intermittent leaks, the teardown test could not be determinative. Whether the particles found on

the safety valve were large enough or of sufficient quantity to have caused the gas leak in the present case is hotly disputed.

Having marshaled their expert witnesses and having ruled out to their satisfaction all other sources of the gas leak save for the gas control on the water heater, the Bitlers filed suit in Colorado State Court against White-Rodgers, as well as A.O. Smith Corporation, which manufactured the water heater, and National Propane Corporation, which installed and maintained the water heater and propane piping in the house. After removing the case to federal district court, defendants moved for summary judgment, contesting the admission of the plaintiffs' expert testimony as insufficiently reliable and lacking a firm foundation in science. In an order denying the motion, the trial judge found that the Bitlers' proposed expert testimony was relevant and reliable in accord with the standard required by *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993). The matter proceeded to a two-week jury trial, at the close of which the jury returned a verdict against White-Rodgers and National Propane, attributing fifty percent of the fault to National Propane and forty percent to White-Rodgers, and awarding $2,319,492.27 in damages to the Bitlers. As to White-Rodgers specifically, the jury found both negligence and product defect. In its order of October 30, 2002, the district court denied White-Rodgers' motions for judgment as a matter of law and for a new trial. This appeal followed.

II

We review de novo whether the district court properly performed its role as "gatekeeper" in admitting or excluding expert testimony. *Dodge v. Cotter Corp.*, 328 F.3d 1212, 1223 (10th Cir. 2003) ("Though the district court has discretion in how it conducts the gatekeeper function, we have recognized that it has no discretion to avoid performing the gatekeeper function."). We review for abuse of discretion the manner in which the district court exercises its *Daubert*

"gatekeeping" role in making decisions whether to admit or exclude testimony. *General Elec. Co. v. Joiner*, 522 U.S. 136, 139 (1997). We will not, however, disturb a district court's ruling absent our conviction that it is arbitrary, capricious, whimsical, manifestly unreasonable, or clearly erroneous. *Goebel v. Denver and Rio Grande W. R.R. Co.*, 346 F.3d 987, 990 (10th Cir. 2003). The district court must, however, make specific factual findings on the record which are sufficient for an appellate court to review the trial court's conclusion concerning whether the testimony was scientifically reliable and factually relevant. *Dodge*, 328 F.3d at 1223. Our standard of review of a trial court's factual findings in pursuit of its gatekeeping role does not vary when examining exclusion or admission of expert testimony. Our focus on review mirrors that of the trial judge's assessment of the testimony itself: we are concerned with the trial court's performance of its obligation under Rule 702 and *Daubert*, not upon the exact conclusions reached to exclude or admit expert testimony. *See Goebel*, 346 F.3d at 1001 (holding that district court did not abuse its discretion in admitting expert testimony); *Mitchell v. Gencorp Inc.*, 165 F.3d 778, 784 (10th Cir. 1999) (holding that the district court did not abuse its discretion in excluding expert testimony). Thus, although the district court "must, on the record make *some* kind of reliability determination," *United States v. Velarde*, 214 F.3d 1204, 1209 (10th Cir. 2000), we recognize the wide latitude a district court has in exercising its discretion to admit or exclude expert testimony.

A

White-Rodgers assigns as a principal source of error the district court's performance of its *Daubert* gatekeeping functions. We begin our inquiry into the admissibility of the Bitlers' expert testimony with Fed. R. Evid. 702. In accord with Rule 702, the Supreme Court has determined that the trier of fact "must ensure that any and all scientific testimony or evi-

dence is not only relevant, but reliable." *Daubert*, 509 U.S. at 589. To fulfill its gatekeeping role, a district court must therefore conduct a two-part inquiry.

First, a district court must determine if the expert's proffered testimony—whether it concerns scientific, technical, or other special knowledge—has "a reliable basis in the knowledge and experience of his [or her] discipline." *Id.* at 592; *see also*, *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 149, (1999) (holding that *Daubert*'s general principles apply to all expert matters under Rule 702). By conducting a preliminary inquiry into the expert's qualifications and the admissibility of proffered evidence, a district court fulfills its initial obligation under Fed. R. Evid. 104(a) ("Preliminary questions concerning the qualification of a person to be a witness . . . or the admissibility of evidence shall be determined by the court"). To determine whether expert testimony is admissible requires a trial court to examine "whether the reasoning or methodology underlying the testimony is scientifically valid . . . ." *Daubert*, 509 U.S. at 592-93. In order to establish an expert's testimony as reliable, we have held that:

> The plaintiff need not prove that the expert is undisputably correct or that the expert's theory is "generally accepted" in the scientific community. Instead, the plaintiff must show that the method employed by the expert in reaching the conclusion is scientifically sound and that the opinion is based on facts which sufficiently satisfy Rule 702's reliability requirements.

Mitchell, 165 F.3d at 781 (citation omitted).

Providing guidance as to the kinds of factors that might bear on a judge's gatekeeping determination, the Supreme Court has suggested that a court consider: (1) whether a theory has been or can be tested or falsified, (2) whether the theory or technique has been subject to peer review and pub-

lication, (3) whether there are known or potential rates of error with regard to specific techniques, and (4) whether the theory or approach has "general acceptance." *Daubert*, 509 U.S. at 593-94. The Court has made clear, however, that this list is neither definitive nor exhaustive and that a trial judge has wide discretion both in deciding how to assess an expert's reliability and in making a determination of that reliability. *Kumho Tire Co.*, 526 U.S. at 150, 152-53; *see also Velarde*, 214 F.3d at 1208-09. While these factors are most relevant in the context of a new and novel scientific theory—asking if it has been tested, subjected to peer review and publication, etc.—they do provide examples of the general kinds of issues a trial court need probe in light of its purpose of ensuring that an expert "employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152. Failure to consider one, or even any, of these factors, albeit suggestive, will not be dispositive of a district court's failure to fulfill its gatekeeping role because that role depends on the underlying factual circumstances of the particular case.

Accordingly, a trial court's focus generally should not be upon the precise conclusions reached by the expert, but on the methodology employed in reaching those conclusions. *Daubert*, 509 U.S. at 595. Although it is not always a straightforward exercise to disaggregate method and conclusion, when the conclusion simply does not follow from the data, a district court is free to determine that an impermissible analytical gap exists between premises and conclusion. *See Joiner*, 522 U.S. at 146; *Dodge*, 328 F.3d at 1222. When examining an expert's method, however, the inquiry should not be aimed at "the exhaustive search for cosmic understanding but for the particularized resolution of legal dis-

putes." *Daubert*, 509 U.S. at 597.[1] Thus it is the specific relation between an expert's method, the proffered conclusions, and the particular factual circumstances of the dispute, and not asymptotic perfection, that renders testimony both reliable and relevant.

Second, in fulfilling its *Daubert* obligations a trial court must also conduct a further inquiry into whether proposed testimony is sufficiently "relevant to the task at hand." *Daubert*, 509 U.S. at 597. Relevant evidence "means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." Fed. R. Evid. 401. The Supreme Court has described the consideration of relevant evidence as one of "fit." *Daubert*, 509 U.S. at 591. A trial court must look at the logical relationship between the evidence proffered and the material issue that evidence is supposed to support to determine if it advances the purpose of aiding the trier of fact. Even if an expert's proffered evidence is scientifically valid and follows

---

[1] Determining whether proffered testimony is scientifically reliable can be a considerable challenge for a trial judge. As Justice Breyer has noted, "this requirement will sometimes ask judges to make subtle and sophisticated determinations about scientific methodology and its relation to the conclusions an expert witness seeks to offer—particularly when a case arises in an area where the science itself is tentative or uncertain . . . ." *Joiner*, 522 U.S. at 147-48 (Breyer, J., concurring). To fulfill this task, however, as Judge Posner has observed, "we do not have to become philosophers of science and set forth the necessary and sufficient conditions of 'real' science," or endeavor to discover "the essence of 'science,' if there is such an essence." *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318 (7th Cir. 1996). We may leave the philosophy of science to the philosophers.

appropriately reliable methodologies, it might not have sufficient bearing on the issue at hand to warrant a determination that it has relevant "fit." *Id.* Testimony concerning the laws of quantum mechanics may be scientifically relevant, but may have no practical relevance to testimony concerning the function and possible failure of a water heater safety valve control. Evidence appropriate for one purpose, therefore, may not be relevant for a different purpose, and it is the trial court's task to make this fitness determination.

B

In fulfilling its *Daubert* gatekeeping function, the district court, in its order denying summary judgment to the defendants, focused on two expert witnesses proposed by the Bitlers: Elden Boh and Donald Sommer. On reviewing the record, we note that the actual testimony offered at trial does not differ in material respects from either Boh's or Sommer's depositions as analyzed by the district court on motions for summary judgment. Nonetheless White-Rodgers argues that the magistrate judge was required to perform a gatekeeping role by entertaining anew, during pre-trial proceedings, defendant's objections to the testimony of Sommer; the magistrate judge instead treated District Judge Nottingham's order denying summary judgment as law of the case, and refused to consider de novo the issue of whether to admit the Bitlers' expert testimony. It is clear, however, that because White-Rodgers did not raise new issues concerning the reliability of the Bitlers' expert witnesses, the district court did not fail to perform its *Daubert* role merely by refusing to reconsider the question of admissibility that had already been decided. *Daubert* does not require a district court to linger at the "gate," as if caught in Zeno's paradox, unable to proceed to the main trial without first conducting a series of mini-trials with regard to every objection raised against a party's expert witnesses.

As to reliability regarding Boh's testimony, the district court specifically found that Boh's methodology in reaching his conclusion about the cause of the explosion was sound. Employing his experience and knowledge as a fire investigator, Boh observed the physical evidence at the scene of the accident and deduced the likely cause of the explosion. Although such a method is not susceptible to testing or peer review, it does constitute generally acceptable practice as a method for fire investigators to analyze the cause of fire accidents. *See Kumho Tire Co.*, 526 U.S. at 150 ("the relevant reliability concerns may focus upon personal knowledge or experience"). Nothing in Rule 702 or *Daubert* requires more. We conclude that the trial court did not abuse its discretion in finding Boh's personal experience, training, method of observation, and deductive reasoning sufficiently reliable to constitute "scientifically valid" methodology.

With regard to the testimony of Donald Sommer, as well as other experts testifying for the Bitlers, White-Rodgers argues that his testimony constituted impermissible speculation because he failed to test his theory that copper sulfide particles passed through and around the mesh screen to lodge on the safety valve seat and thereby cause the gas leak. Furthermore, White-Rodgers argues that Sommer's theory fails to "fit" the known facts that no particles of sufficient size to cause a leak were found on the seat of the valve. Finally, White-Rodgers contests the reliability of the so-called "differential diagnosis" method Sommer employed.

We turn to the issue whether the Bitlers' experts, particularly Sommer, were required to test their theory. No doubt, *Daubert* noted that a key factor in valid scientific methodology is the practice of testing hypotheses to determine whether they can be falsified. *Daubert*, 509 U.S. at 593 (citing Karl Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (5th ed. 1989), who emphasized the importance of testing scientific theories to deter-

mine whether they can withstand critical scrutiny). One object of Popper's method of falsification as a way of testing a scientific theory is to acknowledge that any scientific theory is subject to future refutation through further observation and testing. Popper's emphasis, however, is aimed at theories purporting to explain the causal relations among regularly occurring natural phenomena. (Ptolemy's theory of the movement of celestial bodies which hypothesized that the Earth was the center of the solar system, later falsified by Copernicus, is a prominent example of such a scientific theory subject to falsification by further inquiry.) Although we would not conclude from the citation to Popper, or the logical positivist Carl Hempel, *id.* at 593, that the Supreme Court intended to limit a district court's consideration of whether testing would assist the trier of fact only to those instances of scientific knowledge aimed at such causal relations, we do find the emphasis suggested by the citations instructive.

For example, in *Truck Ins. Exch. v. MagneTek Inc.*, 360 F.3d 1206, 1211-1212 (10th Cir. 2004), plaintiff attempted to introduce evidence of a novel theory, "pyrolysis," which hypothesized that wood could ignite at temperatures much lower than normal under particular circumstances. We affirmed the district court's decision to exclude this evidence because plaintiff's experts had failed to test their novel theory sufficiently to demonstrate its scientific reliability. *Id.* at 1213. When an expert proposes a theory that modifies otherwise well-established knowledge about regularly occurring phenomenon, such as the normal ignition temperature of wood, we would expect the importance of testing as a factor in determining reliability to be at its highest. Here, by contrast, plaintiffs' experts propose a theory about how the accident occurred given the known science of copper sulfide particulate contamination as a cause of propane gas leaks. What distinguishes the present case is that the need for testing is not at its highest because the reliability of the science of copper sulfide contamination is not in dispute, and thus the dis-

trict court did not abuse its discretion in finding that the presence of a screen did not alter the reliability of the fundamental science.

Whether the Bitlers established that the copper sulfide particles and grease found on the valve seat caused this accident is a matter the district court determined goes to the sufficiency of the evidence—not its scientific reliability. Defendants misunderstand what is at stake in a reliability analysis when they claim that the mere addition of a screen fundamentally and necessarily changed the nature of the underlying science such that the district court abused its discretion in admitting plaintiffs' expert testimony. No doubt, presence of the screen changed the causal analysis the jury was required to conduct based on the conflicting evidence presented, but the presence of a screen did not change the analysis into one that necessarily required further testing to determine its scientific reliability. The core science—that copper sulfide particles are the kind of thing that when lodged on the valve seat can cause leaks—is sufficiently well-established that the district court did not abuse its discretion in finding it reliable. The core dispute—whether copper sulfide particles found on the valve seat in this case were sufficient to cause a leak—is one the district court could properly determine is a question for the jury. In light of this evidentiary dispute, the Bitlers need only establish by a preponderance of the evidence that copper sulfide particles caused the gas explosion in their basement. *See, e.g., Kaiser Found. Health Plan v. Sharp*, 741 P.2d 714, 719 (Colo. 1987). Had their experts conducted further tests on their water heater's safety valve and established by observation that it did intermittently fail, they may have established causation to a near certainty. But

such a high degree of certainty is not required.[2] Thus, because testing is not necessary in all instances to establish reliability under *Daubert*, and because the district court reasonably found that it was not required by the particular factual circumstances of this case, we conclude that the district court did not abuse its discretion in admitting the Bitlers' experts' testimony.

With regard to White-Rodgers' argument that the Bitlers' experts impermissibly relied on a method of "differential diagnosis," we note that the term is being used analogically to its proper use in a medical context; nonetheless, we conclude that in this circumstance it is a valid scientific technique to establish causation.[3] Concerning the method he

---

[2] As to alleged shortcomings of the proffered testimony, these go to "the weight which the trier of fact should accord the evidence and do not make the testimony incredible." *Orth v. Emerson Elec. Co.*, 980 F.2d 632, 637 (10th Cir. 1992). Nowhere does Rule 702 or *Daubert* require a finding that an expert's proffered testimony reach absolute certainty with regard to the likely truth of a conclusion. *See Daubert*, 509 U.S. at 590 ("Of course, it would be unreasonable to conclude that the subject of scientific testimony must be 'known' to a certainty; arguably, there are no certainties in science.").

[3] Urging us to adopt the analysis in *Stibbs v. Mapco*, 945 F. Supp. 1220 (D. Iowa 1996), which also involved a LP gas explosion implicating one of their controls, White-Rodgers argues that the inference involved in differential diagnosis "turns scientific analysis on its head." *Id.* at 1226. We reject this reasoning as itself fundamentally unsound as we explain *infra*. Furthermore, we adopt the district court's apt analysis distinguishing *Stibbs* on its facts from the present case—*viz.*, in *Stibbs* the plaintiff's evidence consisted of a mark on the safety valve and the absence of a leak

[Footnote continued on next page]

employed in his investigation, Sommer testified that he undertook a process of eliminating alternative possible causes, determining that these possibilities were improbable sources of the explosion, and arriving at a highly probable cause for the gas leak, calling it a method of "differential diagnosis." "Differential diagnosis," is "the determination of which of two or more diseases with similar symptoms is the one from which the patient is suffering, by a systematic comparison and contrasting of the clinical findings." *Stedman's Medical Dictionary* 492 (27th ed. 1995).[4] In the medical context, differential diagnosis is a common method of analysis, and federal courts have regularly found it reliable under *Daubert*. *Goebel*, 346 F.3d at 999 (concluding that a district court may admit a differential diagnosis it determines is reliable); *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 262 (4th Cir. 1999) (holding that differential diagnosis is a reliable technique "of identifying the cause of a medical problem by eliminating the likely causes until the most probable one is isolated"); *Clausen v. M/V New Carissa*, 339 F.3d 1049, 1058-59 (9th Cir. 2003) (recognizing differential diagnosis as a reliable method); *Zuchowicz v. United States*, 140 F.3d 381, 387 (2d Cir. 1998) (upholding district court decision to admit differential diagnosis testimony). What is not so clear

---

[Footnote continued from previous page]

elsewhere, with no evidence of debris downstream nor testimony as to how debris could have migrated past the screen.

4 Used in its traditional medical sense, the term refers "to the diagnosis of disease, and refers to the process of identifying external causes of diseases and conditions as 'determining cause' . . . as the circumstances warrant." Federal Judicial Center, *Reference Manual on Scientific Evidence* 444 (2d ed. 2000).

is whether "differential diagnosis" is an appropriate method when employed outside of the medical context.

Here, however, the Bitlers' experts use a general method more aptly characterized as a process of reasoning to the best inference.[5] The Bitlers' experts must reason, as it were, backwards to the cause of a single explosion, and to do so requires a process of eliminating possible causes as improbable until the most likely one is identified. For example, Sommer and Boh both testified to how they eliminated the gas leaks in the bedroom and the T-connector above the water heater as likely sources of the accident; the one was not located close enough to the source of the explosion, and the other was itself most likely the result of trauma caused by the explosion. Sommer testified that the force of the explosion lifted the house off its foundation, and accordingly, was the most probable cause of the leak at the T-connector, especially in light of its damaged physical condition. Experts must provide objective reasons for eliminating alternative causes when employing a "differential analysis." *See Clausen*, 339 F.3d at 1058. Furthermore, the inference to the best explanation must first be in the range of possible causes; there must be some independent evidence that the cause identified is of the type that could have been the cause. *See Joiner*, 522 U.S. at 146 ("[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence

---

[5] Unlike a logical inference made by deduction where one proposition can be logically inferred from other known propositions, and unlike induction where a generalized conclusion can be inferred from a range of known particulars, inference to the best explanation—or "abductive inferences"—are drawn about a particular proposition or event by a process of eliminating all other possible conclusions to arrive at the most likely one, the one that best explains the available data.

that is connected to existing data only by the ipse dixit of the expert."). But more than mere possibility, an inference to the best explanation for the cause of an accident must eliminate other possible sources as highly improbable, and must demonstrate that the cause identified is highly probable.[6] In the present case, it is uncontroverted that if copper sulfide particles of sufficient size became lodged on the safety valve seat, then a gas leak substantial enough to cause the explosion in the Bitlers' basement could occur. Whether or not that actually occurred is a question that may be answered by inference to the best explanation.[7] We see no abuse of discretion, especially in light of our deferential standard of review, in the district court's admitting expert testimony that employs an expert's physical investigation, professional experience, and technical knowledge to establish causation in this case.

---

[6] An expert must show that other causes are improbable when conducting differential diagnosis, but '[t]his is not to say that an expert, in order to testify on causation, must be able to categorically exclude each and every possible alternative cause . . . ."—to require otherwise "would mean that few experts would ever be able to testify." Stephen A. Saltzburg et al., *Federal Rules of Evidence Manual* 702-33 (8th ed. 2002). Indeed, "the underlying premise of differential diagnosis is that there is an established connection between certain possible causes and a condition or symptom—then all of the established causes are ruled out but one." *Id.* at 702-35.

[7] As Judge Kozinski noted on remand in *Daubert*: "Not knowing the mechanism whereby a particular agent causes a particular effect is not always fatal to a plaintiff's claim. Causation can be proved even when we don't know precisely *how* the damage occurred, if there is sufficiently compelling proof that the agent must have caused the damage . . . ." *Daubert v. Merrell Dow Pharm.*, 43 F.3d 1311, 1314 (9th Cir. 1995).

Finally, as to the "fit" between the expert testimony and the material issue at stake in this case, White-Rodgers argues that the theory of copper sulfide particulate contamination does not "fit" the facts that the safety valve at issue is a screened valve, and no screened valve had ever been shown to allow sufficient copper sulfide downstream so as to cause a gas leak; furthermore, the valve functioned properly when tested after the accident. This argument confuses a *Daubert* inquiry into relevant "fit" with the jury question of which theory, plaintiffs' or defendant's, best captures the truth of the matter at issue. The former inquiry is aimed at determining if "a valid scientific connection to the pertinent inquiry," *Daubert*, 509 U.S. at 592, obtains as a precondition to the admissibility of expert testimony. Here, the expert testimony "fits" because it involves a reliable method that would aid the jury in resolving a factual dispute; whether the jury finds that the testimony "fits" their best assessment of the truth of the matter is an altogether different issue. Accordingly, the district court did not abuse its discretion in admitting the Bitlers' expert testimony.

Thus, in summation, we conclude that in fulfilling its gatekeeping role pursuant to the Federal Rules of Evidence and *Daubert*, the district court did not abuse its discretion in making its "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Daubert*, 509 U.S. at 592-3.

III

White-Rodgers argues on appeal that safety valve models lacking an inlet screen are substantially dissimilar from models containing the mesh screen and therefore the district court abused its discretion in admitting plaintiff's evidence of accidents involving the unscreened devices.

At trial, the Bitlers introduced evidence of accidents which involved a model of safety valves exactly the same as the one in the Bitlers' water heater save for the absence of the inlet screen. These accidents occurred when copper sulfide particles contaminated the safety valve of unscreened safety controls, preventing the valve from closing fully and resulting in a gas leak. The purpose of this evidence was to demonstrate a key element of the Bitlers' theory of causation: if copper sulfide particles are allowed downstream to contaminate the valve seat, then the safety valve system could fail. Furthermore, the Bitlers argue that this evidence was necessary to prove notice to White-Rodgers of the potential for their safety valves to fail.

In response, White-Rodgers contends that they offered to stipulate to the failures of the unscreened device, and that therefore the admission of evidence involving accidents with unscreened controls was irrelevant. Although White-Rodgers admits that copper sulphide particles can cause leaks in unscreened models, they argue that there has been no demonstration that screened models are susceptible to sufficient contamination to cause leaks; therefore, they suggest that the presence of a screen makes the Bitlers' safety control substantially dissimilar to unscreened devices. Moreover, because these other accidents involving unscreened controls resulted in injuries and deaths, White-Rodgers argues that the evidence was inherently prejudicial.

We review a district court's decision to admit evidence for abuse of discretion. *Smith v. Ingersoll-Rand Co.*, 214 F.3d 1235, 1246 (10th Cir. 2000). As a threshold matter, we will admit evidence of prior accidents in a products liability suit if it is relevant to the present inquiry. *Id.* To determine relevancy, we must examine whether there is substantial similarity between the evidence offered of prior accidents and the facts at issue in the present case. "Before introducing such evidence, the party seeking its admission must show the

circumstances surrounding the other accidents were substantially similar to the accident involved in the present case." *Wheeler v. John Deere Co.*, 862 F.2d 1404, 1407 (10th Cir. 1988); *Black v. M & W Gear Co.*, 269 F.3d 1220, 1227 (10th Cir. 2001). Determining whether and to what extent proffered evidence of prior accidents involves substantially similar circumstances will depend on the underlying theory of the case advanced by the plaintiffs. If the evidence of other accidents is substantially similar to the accident at issue in a particular case, then that evidence will assist the trier of fact by making the existence of a fact in dispute more or less probable, and the greater the degree of similarity the more relevant the evidence. *See Four Corners Helicopters, Inc. v. Turbomeca, S.A.*, 979 F.2d 1434, 1440 (10th Cir. 1992). Naturally, this is a fact-specific inquiry that depends largely on the theory of the underlying defect in a particular case. *Id.* Accordingly, the district court is owed considerable deference in its determination of substantial similarity.

With regard to the Bitlers' proposed evidence of accidents involving unscreened devices, the district court ruled that these prior accidents involved substantially similar devices to the one involved in the present accident, and accordingly denied the defendant's motion in limine to exclude. In order to demonstrate notice and the existence of a defect, namely the consequences of copper sulfide contamination, the district court ruled that exact similarity between the devices was not required and its absence would not compel exclusion. We have routinely held that federal law permits introduction of substantially similar accidents to show notice, the potential existence of a defect, or to refute defense witness testimony. *Four Corners Helicopters, Inc.*, 979 F.2d at 1440.

In light of the plaintiffs' purposes of showing notice and defect, we do not require a showing of exact similarity, and hence we cannot conclude that the district court erred in ad-

mitting evidence it found substantially similar given the circumstances surrounding the Bitlers' accident. In order to demonstrate that copper sulfide particles were capable of causing a gas leak when contaminating the safety valve seat, it was reasonable and relevant for the plaintiffs to introduce evidence of failures in substantially similar devices under substantially similar circumstances. If contamination could cause gas leaks absent an inlet screen, then if the plaintiffs could show that particles could get through or around the screen—the essence of the plaintiffs' case—it would be reasonable for jurors to make a determination as to causation in the present case. Offering evidence that the industry was aware as early as 1967 that copper sulfide contamination could be a problem for gas control valves served the purpose of demonstrating notice to White-Rodgers and of highlighting the potential existence of a defect—part of the underlying theory of the plaintiff's case which goes to establish a standard in this case for "how substantial the similarity must be . . . ." *Ponder v. Warren Tool Corp.*, 834 F.2d 1553, 1560 (10th Cir. 1987) (citation omitted). Indeed, the district court found that the similarity between the two models of safety valves, for purposes of the trial, was not only substantial, but constituted a "high degree of similarity" in light of other evidence demonstrating that even with the screen, copper sulfide particles were found downstream from the screen. (4 R. at 967.)

We see no error in the district court's finding. Accordingly, we hold that the district court did not abuse its discretion in admitting evidence of prior accidents involving unscreened safety valves.

IV

White-Rogers argues that the district court erred by giving a jury instruction on failure to warn of known and nonobvious defects in its safety valve. Whether a jury was properly instructed in accord with the applicable law and consis-

tent with matters properly within its province is a question we review de novo. *Gardetto v. Mason*, 100 F.3d 803, 816 (10th Cir. 1996). However, we will review for abuse of discretion a district court's exercise of its discretion in giving a particular jury instruction. *Hynes v. Energy West, Inc.*, 211 F.3d 1193, 1197 (10th Cir. 2000).

Arguing that the issue of a duty to warn was not supported by the evidence, and hence not a matter properly submitted to the jury, White-Rodgers objects to the district court's presentation of the following instruction to the jury:

> If A.O. Smith and White-Rodgers, a wholly-owned division of Emerson Electric, as manufacturers or sellers of a product know or in the exercise of reasonable care should know that the use of the product may be harmful or injurious to a user, and such risk of harm or injury is not obvious to a reasonable user, then the manufacturer and seller must use reasonable care to warn the user of the risk of harm or injury if a reasonably careful person would under the same or similar circumstances. The failure to do so is negligence.

(13 R. at 3525.)

As a threshold matter, we are persuaded that White-Rodgers' assignment of error to the district court's jury instruction on a duty to warn is not properly preserved for appeal. At trial, White-Rodgers objected generally to the jury instruction concerning a duty to warn, arguing only that there

is neither a basis for, nor an issue of, a failure to warn.[8] Defendant further objected that plaintiffs failed to establish any evidence for the instruction. Rejecting White-Rodgers' inchoate objections, the district court found "that there is evidence sufficient to allow the jury to determine that White-Rodgers knew prior to this accident of the migration of copper sulfide around the screen only device, which the jury could conclude required a duty to warn." (12 R. at 3057-58.)

On appeal, White-Rodgers now asserts that the jury instruction on a failure to warn was error because plaintiffs presented no evidence of proximate causation. Specifically, Appellant now argues that plaintiffs provided no evidence that a warning would have been effective or what the content of that warning would have been. However, at trial Appellants did not raise an objection as to proximate causation distinctly and did not identify specifically the grounds of the objection before the district court as required by Fed. R. Civ. P. 51(c)(1) ("A party who objects to an instruction or the failure to give an instruction must do so on the record, stating distinctly the matter objected to and the grounds of the objection."); *see also Hynes*, 211 F.3d at 1200. White-Rodgers failed to make abundantly clear the grounds and basis for its objection to the jury instruction on a failure to warn, objecting instead in general terms that there was no issue of warning. *See Weir v. Fed. Ins. Co.*, 811 F.2d 1387, 1390 (10th Cir. 1987) (noting that Rule 51 "requires counsel to make abundantly clear to the trial court the objecting party's position") (quotation omitted). To preserve an objection for appeal, it is not enough for an objecting party merely to raise an objection. Instead, the "grounds stated in [an] objection must

---

[8] White-Rodgers' counsel opined generally: "If the product is found to be defective then I guess liability exists. I don't know what we're supposed to warn them about." (11 R. 2995.)

be obvious, plain, or unmistakable." *Id.* (citation omitted); *see also, Medlock v. Ortho Biotech, Inc.*, 164 F.3d 545, 553 (10th Cir. 1999) (noting that "an excessively vague or general objection to the propriety of a given instruction is insufficient to reserve the issue for appeal").

Accordingly, because White-Rogers' objections were not properly specific, the issue of supposed error in the district court's jury instruction regarding failure to warn is not properly preserved for appeal.

V

In the alternative, failing success on its argument to reverse the jury verdict, White-Rodgers argues that the jury award of $150,000 for future wage loss and $75,000 for future medical expenses was not supported by any evidence. When we review a jury's award of damages, we will sustain the award unless it is clearly erroneous or there is no evidence to support the award. *Hudson v. Smith*, 618 F.2d 642, 646 (10th Cir. 1980); *Brown v. Presbyterian Healthcare Servs.*, 101 F.3d 1324, 1330 (10th Cir. 1996).

With regard to the evidence of future wage loss, Mr. Bitler provided tax returns for the years prior and subsequent to the accident and provided testimony concerning his current employment prospects. There is no doubt that evidence was presented that his earnings have declined as a consequence of the accident, and that although he remains employable in some settings, his employment prospects have been substantially diminished. Furthermore, evidence was also offered of benefits he received as a ranch hand, but no longer receives, such as use of the furnished house where the accident occurred and a replacement heifer worth $850, that go beyond his salary as reflected by his tax returns. In light of our highly deferential stance regarding jury determinations of damages, we cannot say that there was no evidence presented to support a jury finding of future lost wages in the amount of $150,000.

Concerning the evidence of future medical expenses, there is no doubt that physician testimony and Mr. Bitler's testimony did not establish precise costs of any future procedures. One physician testifying, Dr. Hartford, described past problems with infections involving Mr. Bitler's skin grafts, and acknowledged a possibility of future infections. Mr. Bitler's plastic surgeon, Dr. Gordon, testified to the future need for procedures to develop Mr. Bitler's fingernails, which Bitler has elected to defer to a later time. (3 R. at 768.) Plaintiff argues that the jury could reasonably estimate future medical expenses based on the stipulation by the parties to past medical expenses. Clearly, such a basis for determining an award for future medical expenses is imprecise and on review is not based on specific and substantial evidence. But we do not review for substantial evidence; rather, we review for clear error whether there is any evidence to support the jury finding. Despite some estimation in the jury's award for future medical expenses, we cannot conclude, in light of our deferential review, that there is no evidence to support the award or that it was clearly erroneous.

Therefore, as to the jury awards for future wage loss and future medical expenses, we affirm.

VI

With regard to the final issue in White-Rodgers' appeal, appellant argues that the jury award of $25,000 for Mrs. Bitler's physical and emotional injury was excessive. Specifically, White-Rodgers argues that negligent infliction of emotional harm was not pled, and because Mrs. Bitler suffered only minor physical injuries in the accident, that the jury award is clearly excessive. We disagree. As appellant concedes, Mrs. Bitler may recover emotional injuries that flow from her own physical injuries. *See, e.g., Williams v. Continental Airlines, Inc.*, 943 P.2d 10, 16 (Colo. App. 1996). Because the circumstance surrounding her admittedly minor physical injury to her knee when the force of the explosion in

the basement forced her off the sofa and onto the floor is itself quite traumatic, we cannot conclude that the jury had no basis for finding the emotional injury associated with her own experience of, and physical injuries from, the explosion—quite apart from the emotional trauma of seeing the injuries sustained by her husband—are grossly excessive. Accordingly, as to the jury's damage award for Mrs. Bitler's negligence claim, we affirm.

VII

For the reasons set forth above, we **AFFIRM**.

APPENDIX B

FILED
United States District Court
Denver, Colorado
MAR 03 2000
JAMES R. MANSPEAKER
Clerk

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLORADO
Judge Edward W. Nottingham

Civil Action No. 98 N 1897

FRED D. BITLER, PEGGY A. BITLER, and COLORADO COMPENSATION INSURANCE AUTHORITY, a political subdivision of the State of Colorado,

Plaintiffs,

v.

A.O. SMITH CORP, a foreign corporation, WHITE ROGERS, a subsidiary of EMERSON ELECTRIC CO., a foreign corporation, and NATIONAL PROPANE CORP., formally, ALL SEASONS PROPANE, a Colorado corporation,

Defendants.

ORDER AND MEMORANDUM OF DECISION

This is a personal-injury case. Plaintiff Fred Bitler was injured in a liquid-propane explosion allegedly caused by a defective hot water heater. Plaintiffs bring claims for (1) negligence, (2) strict products liability, and (3) negligent misrepresentation against Defendants A.O. Smith Corp., White Rogers, a subdivision of Emerson Electric Co. (collectively "White-Rodgers"), and National Propane Corp. ("National Propane") for their respective roles in the design, manufacture, installation, and servicing of plaintiff's hot water heater. This matter is before the court on: (1) "Defendants A.O. Smith Corp. and White-Rodgers Division, Emerson Electric Co.'s Motion for Summary Judgement" filed on July 2, 1999; and (2) National Propane's Motion for Summary Judgment" filed on July 6, 1999. Jurisdiction is based on 28 U.S.C.A. § 1332 (West 1993 & Supp. 1999).

FACTS

1. The Accident

On the evening of July 25, 1996, Fred Bitler returned home from work and discovered a lack of hot water while taking a shower. (Defs. A.O. Smith and White-Rodgers Division, Emerson Electric Co.'s Am. Mem. of Law in Supp. of Its Mot. for Summ. J., Factual and Procedural Background ¶ 1 [filed July 7, 1999] [hereinafter "Def. White-Rodgers' Br."]; *admitted at* Pls.' Resp. to Defs. A.O. Smith and White-Rodgers Division, Emerson Electric Co.'s Mot. for Summ. J. and Am. Mem. of Law, Resp. to Statement of Undisputed Facts ¶ 1 [filed Aug. 16, 1999] [hereinafter "Pl.'s Resp. to Def. White-Rodgers' Br."].) Mr. Bitler went to the basement where the water heater was located to see what the problem was. (*Id.*, Factual and Procedural Background 11; *admitted*

at Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 11.) As he opened the basement door, he smelled gas. (*Id.*, Factual and Procedural Background 11; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 11.) Mr. Bitler then went to shut off the gas flow and started down the basement stairs. (*Id.*, Factual and Procedural Background ¶ 1; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 1.) Mr. Bitler was about three-fourths of the way down the stairs when a liquid-propane explosion occurred, seriously injuring him.[1] (*Id.*, Factual and Procedural Background 11; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 11.)

The Bitler basement consisted of two small rooms with field stone walls connected by a doorway. (*Id.*, Factual and Procedural Background 12; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 12.) The water heater was located in the northwest comer of the north room, next to a cylindrical propane gas space heater. (*Id.*, Factual and Procedural Background 13; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 13.) The gas line that

---

[1] At the time of the accident Mr. Bitler worked at the Oldland Brothers Ranch in Meeker, Colorado, as a ranch hand. As part of his employment, Oldland Brothers provided housing for Mr. Bitler and his wife. It is undisputed that at the time of the accident Mr. Bitler was acting within the scope and course of his employment and covered by a valid worker's compensation policy issued by Colorado Compensation Insurance Company ("CCIA"). Consequently, CCIA's interest in this litigation entails pursuing its subrogation rights for the payment it has made on Mr. Bitler's claim.

supplied propane to both the water heater and the space heater, which consisted of unsupported, flexible copper tubing, ran along the basement ceiling joints. (*Id.*, Factual and Procedural Background ¶ 3; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 3.) Above the water heater, the gas line had a "T" fitting, with one branch running to the water heater control, and the other branch running to the space heater. (*Id.*, Factual and Procedural Background 13; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 13.) In addition to the propane appliances in the basement, the Bitler home contained three other propane appliances located on the first floor: a cook stove in the kitchen, a furnace in the living room, and a space heater in one of the bedrooms. (*Id.*, Factual and Procedural Background 14; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 14.)

2. The Defendants

a. White-Rodgers Defendants

A.O. Smith manufactured the water heater that was installed in the Bitler's basement. (Preliminary Pretrial Order, Stipulations ¶ 2 [filed July 12, 1999].) White-Rodgers manufactured the model 3772U water heater gas control ("White-Rodgers gas control") that was incorporated into the Bitler's hot water heater in 1979. (*Id.*, Stipulations ¶ 3.) The White-Rodgers gas control regulates the flow of gas to the pilot and main burner. (Def. White-Rodgers' Br., Factual and Procedural Background 16; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 16.) The primary function of the White-Rodgers gas control is to shut off all gas flow to the pilot and main burner if the pilot is extinguished. (*Id.*, Factual and Procedural Background 17; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 17.) A user lights the pilot by turning the White-Rodgers gas control

to "pilot" and pushing down. (*Id.*, Factual and Procedural Background 18; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 8.) This drives the reset shaft down and opens the safety valve, thus permitting gas to flow to the pilot. (*Id.*, Factual and Procedural Background 18; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 18.) Once the user lights the pilot, the user holds down the White-Rodgers gas control knob for about one minute, during which time the pilot flame heats the "thermocoupler." (*Id.*, Factual and Procedural Background ¶ 8; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 8.) The heated thermocoupler generates an electrical current which, in turn, energizes a magnet that holds the safety valve open. (*Id.*, Factual and Procedural Background 18; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 18.) If a magnetic seal is established, the pilot will remain lit after the White-Rodgers gas control knob is released and the reset shaft ascends. (*Id.*, Factual and Procedural Background ¶ 8; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 8.) The user then turns the White-Rodgers gas control to the "on" position and gas flows past the safety valve to the main valve. (*Id.*, Factual and Procedural Background 18; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 18.) As long as the pilot burns, the safety valve will stay open and allow gas to flow through to the main burner when there is a demand for heat. (*Id.*, Factual and Procedural Background 17; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 17.) If the pilot goes out, the thermocoupler cools and the electric current de-energizes, allowing the safety valve to release. (*Id.*, Factual and Procedural Background 18; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 8.) When operating properly, the safety

valve will snap shut, prohibiting the flow of gas to the pilot. (*Id.*, Factual and Procedural Background 18; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 18.) As part of its manufacturing process, White-Rodgers tests every gas control to ensure that the safety valve closes properly. (*Id.*, Factual and Procedural Background 16; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 16.)

The White-Rodgers gas control at issue here contained a fine-mesh inlet screen to prevent debris and sediment in the gas stream from reaching the gas control's safety valve and affecting its operations.[2] (*Id.*, Factual and Procedural Background 19; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 19.) Although plaintiffs concede that the design purpose of the mesh screen is to prevent debris from reaching the safety valve, the parties dispute its efficacy. Plaintiffs believe that the screen is ineffective in preventing debris, especially copper sulphide, from bypassing the screen and contaminating the safety valve so that it will not close properly. (Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 19.) In 1980, subsequent to the installation of the Bitler's control, White-Rodgers modified the design of its water heater gas controls by adding a deflection baffle to aid in the prevention of debris reaching the control mechanism. (*Id.*, Resp. to Statement of Undisputed Facts 19.)

The problem of contamination of gas control safety valves like the ones White-Rodgers' manufactures is not a

---

[2] White-Rodgers began installing inlet screen on all of its gas control valves in 1979. Prior to this time, gas control valves were unscreened.

new problem within the gas control industry. As early as 1967, White-Rodgers was aware that copper sulphide and other contaminants could cause automatic safety valves to fail. (Pls.' Resp. to Def. White-Rodgers' Br., Pls.' Additional Disputed Facts 11; *admitted in part at* Defs. A.O. Smith Corporation and White-Rodgers Division, Emerson Electric Co.'s Reply to Pls.' Opp'n to Mot. for Summ. J., Defs.' Resp. to Pls.' Statement of Facts ¶ 1 [filed Aug. 30, 1999] [hereinafter "Def. White-Rodgers' Reply"].) In March 1982, Emerson Electric's Vice President Jon Cicy made a presentation to the National LP Gas Association in which he acknowledged that a major cause of accidents is particle contamination such as copper sulphide. (*Id.*, Additional Disputed Facts 13; *admitted in pertinent part* at Def. White-Rodgers' Reply, Resp. to Pls.' Statement of Facts 13.)

b. National Propane

National Propane sold and installed the water heating system located in the Bitler's home on the Oldland Brothers Ranch. (Notice of Removal, Attach. [Compl. and Jury Demand ¶ 30 (filed in Denver County District Court on Aug. 14, 1998)]; *admitted at* Answer of Def. National Propane Corp. ¶ 30 [filed Sept. 17, 1998].) On March 26, 1991, Dennis Deines, an employee of National Propane, performed a "leak repair" on the Bitler's hot water heater. (Preliminary Pretrial Order, Stipulations ¶ 6 [filed July 12, 1999].) On July 12, 1991, Deines returned to the Bitler home and performed a safety inspection of the gas system and appliances, including the hot water heater. (*Id.*, Stipulations 17.) During his safety inspection, Deines cycled the White-Rodgers control and noted that the safety valve functioned properly. (Def. White-Rodgers' Br., Factual and Procedural Background 15; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 15.)

3. Post Accident Testing

On July 31, 1996, the Oldland Brothers' property insurer retained Elden Boh to conduct an investigation into the cause and origin of the explosion that injured Mr. Bitler. (*Id.*, Factual and Procedural Background ¶ 10; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 110.) As part of his investigation, Boh tested the Bitler's gas system and found two leaks—one in the bedroom space heater and another in the "T" connection in the piping near the basement ceiling. (*Id.*, Factual and Procedural Background ¶ 10; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 10.) Boh, however, did not test the White-Rodgers gas control to determine if it leaked. (Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 110.) On August 25, 1996, Boh removed the water heater from the Bitler basement, but in the process dropped the water heater down the basement stairs, breaking the gas inlet piping. (Def. White-Rodgers' Br., Factual and Procedural Background ¶ 11; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 11.) Although plaintiffs contend that the inlet piping could still be tested after Boh dropped the water heater, neither party tested the inlet piping. (*Id.*, Factual and Procedural Background ¶ 11; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 11.)

On December 6, 1996, the parties examined and tested the White-Rodgers gas control. (*Id.*, Factual and Procedural Background ¶ 12; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 112.) The White-Rodgers gas control performed properly in every test conducted by the parties. (*Id.*, Factual and Procedural Background 112; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 12.) In one test, the safety valve magnet was energized to

simulate a lit pilot light, and then the power was interrupted to replicate a pilot outage. (*Id.*, Factual and Procedural Background ¶ 13; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 13.) It is undisputed that the safety valve operated properly, fully closing to prevent any gas flow. (*Id.*, Factual and Procedural Background 113; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 113.) Despite these undisputed results, plaintiffs take issue with the testing methods and contend that White-Rodgers has previously admitted that in similar cases involving known contaminated safety valves, post-accident testing did not reveal any leaks. (Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 8.)

On June 23, 1998, White-Rodgers' Director of Product of Safety, Kevin Kyle, disassembled the White-Rodgers' gas control in the presence of plaintiffs' expert Donald Sommer. (*Id.*, Factual and Procedural Background 114; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 114.) The results of the disassembly and the conclusions drawn therefrom are hotly contested. Disassembly revealed that the inlet screen was in place and that there was particle debris both upstream and downstream of the inlet screen. (*Id.*, Factual and Procedural Background 114; *admitted at* Pls.' Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts 114.) The exact amount of debris downstream and its significance is subject to debate. Kyle claims that he observed only some very fine particles at the base of the safety valve power unit and that there was no visible accumulation of debris on the safety valve seat. (*Id.*, Factual and Procedural Background 114) Sommers, on the other hand, claims that there were contaminate particles downstream of not only the screen, but also the safety shut-off valve, and the valve seat plunger, and that there was debris on the central area of the seal. (Pls.'

Resp. to Def. White-Rodgers' Br., Resp. to Statement of Undisputed Facts ¶ 14.)

On April 15, 1999, plaintiffs disclosed Donald Summer, Troy Bowman, W. Alan Bullerdiek, Thomas Crane, Elden Boh, and William Kelner as their expert witnesses. As a result of examining the Bitler's basement and the White-Rodgers' gas control, and based upon their own experience and knowledge, plaintiffs' experts surmised that the gas stream flowing to the Bitler's hot water heater carries copper sulphide particles that bypassed the inlet screen and lodged on the safety valve, thereby preventing the safety valve from fully closing when the pilot light went out. The failure of the safety valve to close properly, in turn, caused a gas leak that was ignited when Mr. Bitler entered the basement. Plaintiffs' experts also theorized that the particles that caused the gas leak were dislodged from the safety valve seat after the explosion by (1) the force of the explosion, (2) some unknown person manipulating the control knob after the incident, or (3) Boh's dropping of the water heater down the basement stairs.

4. Procedural History

On August 14, 1998, plaintiffs filed their complaint in Denver County District Court, asserting claims for: (1) strict products liability against White-Rodgers with respect to the design of the White-Rodgers's gas control valve and White-Rodgers' failure to warn consumers of the dangers associated with its gas control valve; (2) negligent product design against White-Rodgers; (3) negligence against National Propane; (4) negligent misrepresentation against all defendants; and (5) loss of consortium against all defendants. (Notice of Removal, Attach. [Compl. and Jury Demand ¶¶ 20-40 (filed in Denver County District Court on Aug. 14, 1998)].) On September 2, 1998, defendants removed the action to this court, pursuant to 28 U.S.C.A. § 1441 (West 1994). (*Id.*) On July 2 and July 6, 1999, White-Rodgers and

National Propane, respectively, moved for summary judgment. (Defs. A.O. Smith Corp. and White-Rodgers Division, Emerson Electric Co.'s Mot. for Summ. J. [filed July 2, 1999]; National Propane's Mot. for Summ. J. [filed July 6, 1999].) Both White-Rodgers and National Propane argue that plaintiffs' experts opinions regarding the cause of the explosion that injured Mr. Bitler are inadmissible under rule 702 of the Federal Rules of Evidence and the Supreme Court's ruling in *Daubert v. Merrill Dow Pharms., Inc.*, 509 U.S. 579, 113 S. Ct. 2768 (1993). (Def. White-Rodgers' Br. at 16-26; National Propane's Br. in Supp. of Its Motion for Summ. J. at 6-16 [filed July 6, 1999] [hereinafter "Def. National Propane's Br."].) White-Rodgers and National Propane argue that without these expert opinions, plaintiffs cannot put forth sufficient evidence to establish a genuine issue of material fact with respect to every essential element of their claims as to which they have the burden of proof at trial. (Def. White-Rodgers' Br. at 27; Def. National Propane's Br. at 16.)

ANALYSIS

1. Legal Standard

Pursuant to rule 56(c) of the Federal Rules of Civil Procedure, the court may grant summary judgment where "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and the . . . moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c); *see Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250, 106 S. Ct. 2505, 2511 (1986); *Concrete Works, Inc. v. City & County of Denver*, 36 F.3d 1513, 1517 (10th Cir. 1994). The moving party bears the initial burden of showing an absence of evidence to support the nonmoving party's case. *Celotex Corp.*, 477 U.S. at 325, 106 S. Ct. at 2554. "Once the moving party meets this burden, the burden shifts to the nonmoving party to demonstrate a genuine issue

for trial on a material matter." *Concrete Works, Inc.*, 36 F.3d at 1518 (citing *Celotex Corp.*, 477 U.S. at 325, 106 S. Ct. at 2554). The nonmoving party may not rest solely on the allegations in the pleadings, but must instead designate "specific facts showing that there is a genuine issue for trial." *Celotex Corp.*, 477 U.S. at 324, 106 S. Ct. at 2553; *see* Fed. R. Civ. P. 56(e). The court may consider only admissible evidence when ruling on a summary judgment motion. *See World of Sleep, Inc. v. La-Z-Boy Chair Co.*, 756 F.2d 1467, 1474 (10th Cir. 1985). The factual record must be viewed in the light most favorable to the nonmoving party. *Concrete Works, Inc.*, 36 F.3d at 1518 (citing *Applied Genetics Int'l, Inc. v. First Affiliated Sec., Inc.*, 912 F.2d 1238, 1241 [10th Cir. 1990]).

2. Admissibility of Plaintiffs' Expert Witnesses' Testimony

Because this a diversity case and the injury occurred in Colorado, Colorado law governs plaintiffs' state-law tort claims against defendants. *Erie v. Tompkins*, 304 U.S. 64, 58 S. Ct. 817 (1938). Plaintiffs assert a claim for strict products liability against White-Rodgers. (Notice of Removal, Attach. [Compl. and Jury Demand ¶¶ 25-28 (filed in Denver County District Court on Aug. 14, 1998)].) In order to recover on a theory of strict products liability, a plaintiff must establish that: (1) the product is in a defective condition unreasonably dangerous to the user or consumer; (2) the product is expected to and does reach the consumer without substantial change in the condition in which it was sold; (3) the defect caused the plaintiff's injuries; (4) the defendant sold the product and is engaged in the business of selling products; and (5) the plaintiff sustained damages. *Barton v. Adams Rental, Inc.*, 938 P.2d 532, 536-37 (Colo. 1997) (citations omitted). Plaintiffs also assert negligence claims against White-Rodgers and National Propane. (Notice of Removal, Attach. [Compl. and Jury Demand ¶¶ 20-24, 29-33 (filed in Denver County District Court on Aug. 14, 1998)].) To

establish a prima facie case for negligence, regardless of the specific negligence theory, Colorado law requires a plaintiff to establish: (1) the existence of a legal duty owed by the defendant to the plaintiff; (2) breach of that duty; and (3) a sufficient causal relationship between the defendant's breach and the plaintiffs injuries. *Martinez v. Lewis*, 969 P.2d 213, 217 (Colo. 1998). White-Rodgers and National Propane contend that they are entitled to summary judgment because plaintiffs' experts' testimony is inadmissible under rule 702 of the Federal Rules of Evidence, and, thus, plaintiffs' cannot establish the causation element in either of these claims.[3]

Although I apply Colorado substantive law to plaintiffs' tort claims, federal law controls questions concerning foundation for expert testimony. *Orth v. Emerson Elec. Co., White-Rodgers Div.*, 980 F.2d 632, 636 (10th Cir. 1992). Rule 702 of the Federal Rules of Evidence governs the admissibility of scientific and technical expert testimony. Rule 702 requires a determination that the proffered expert testimony (1) is based on scientific or technical knowledge, and (2) will assist the trier of fact to understand the evidence or determine a fact in issue.[4] Fed. R. Evid. 702. In *Daubert*, the Supreme Court set forth parameters for analyzing the admissibility of scientific evidence. *Daubert*, 509 U.S. at

---

[3] Because White-Rodgers and National Propane raise the same arguments with respect to the admissibility of plaintiffs' expert witnesses' testimony, I address their motions together.

[4] In full, rule 702 provides "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Fed. R. Evid. 702.

589-96, 113 S. Ct. at 2795-99. *Daubert*, in essence, requires the district court to conduct an evidentiary "gate-keeping" inquiry to determine whether an expert's proffered testimony pertaining to scientific knowledge is reliable. This requires "a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and whether it can be properly applied to the facts in issue." *Id.* at 592-93, 113 S. Ct. at 2797. The second requirement of rule 702—that the evidence be helpful to the trier of fact—is primarily a question of relevance. *Id.* at 590, 113 S. Ct. at 2795 ("Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful.") (internal quotations and citations omitted).

To guide courts in this heady task, the *Daubert* court set forth several factors that a district court should consider in assessing the admissibility of scientific evidence: (1) whether the technique can and has been tested; (2) whether the technique has been subjected to peer review; (3) the known potential error rate of the technique; (4) the existence and maintenance of standards controlling the technique's operation; and (5) whether the technique has gained general acceptance in the scientific community.[5] *Id.* at 593-95, 113 S. Ct. at 2797-98. *Daubert* makes clear, however, that these factors do not represent "a definitive checklist or test." *Id.* at 593, 113 S. Ct. 2786. Rather, this list is non-exhaustive and "the inquiry envisioned by Rule 702 is . . . a flexible one." *Id.* at 594, 113 S. Ct. at 2797; *accord Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1175 (1999) ("[W]e conclude

---

[5] Although *Daubert* only addressed the issue of admissibility scientific evidence, the Supreme Court recently decided that the *Daubert* inquiry also extends to "technical or other specialized knowledge." *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 119 S. Ct. 1167, 1175 (1999).

that the trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable. That is to say, a trial court should consider the specific factors identified in *Daubert* where they are reasonable measures of the reliability of expert testimony.") With these principles in mind, I now address the admissibility of the expert testimony proffered by plaintiffs.

a. Eldon Boh

i. Qualifications

Eldon Boh is a former fire fighter for both the Cherry Hills and Denver Fire Departments. (Attachs. to Mem. Br. and Resp. to Defendants' [sic] White-Rodgers and Emerson Electric's Mot. for Summ. J., Ex. 16 [Curriculum Vitae of Eldon Boh] [filed Aug. 16, 1999] [hereinafter "Pls.' Attachs. to Resp. to Def. White-Rodgers' Br."].) He has nearly thirty-years experience in fire investigation and has investigated approximately 2200 fires in eleven states. (*Id.*, Ex. 16 [Curriculum Vitae of Eldon Boh].) Boh's investigations include occurrences of fires in residential as well as commercial properties, and fires that were accidental or incendiary in nature. (*Id.*, Ex. 16 [Curriculum Vitae of Eldon Boh].) Boh has testified numerous times in various state and federal courts in the areas of fire cause and origin and products liability. (*Id.*, Ex. 16 [Curriculum Vitae of Eldon Boh].) In addition, he has attended numerous fire science technology courses, lectured extensive to the Denver Police and Fire Departments and other organizations, and is a member of several local and national professional associations dealing with fire investigation. (*Id.*, Ex. 16 [Curriculum Vitae of Eldon Boh].)

ii. Boh's Opinion

Boh's proffered testimony concerns the cause and origin of the explosion that injured Mr. Bitler. It is Boh's opinion

that the cause of the explosion was the ignition of propane gas leaking from the White-Rodgers gas control. (*Id.*, Ex. 13 [Boh Dep. at 230], Ex. 14 [Boh Supplemental Report].) Boh also opines that the source of the ignition was the electrical wiring that ran along the ceiling of the Bitler's basement. (*Id.*, Ex. 13 [Boh Dep. at 230].) The methodology that Boh employed was his personal observation and training as a fire investigator. On this basis, he concluded that the White-Rodgers gas control was the source of the propane leak because of the elimination of other sources of ignition. (*Id.*, Ex. 13 [Boh Dep. at 231].) Boh testified that he eliminated the upstairs appliances primarily because they were not in the area of origin. (*Id.*, Ex. 13 [Boh Dep. at 231].) He also eliminated the space heater, the only other propane appliance in the basement, because it was not "on" and the nature of the explosion permitted a conclusion that the source of the explosion was at the hot water heater. (*Id.*, Ex. 13 [Boh Dep. at 231].)

According to Boh, the flash and scorch patterns and the fact that the explosion pushed up the living room floor suggested that there was a large accumulation of propane gas in the basement and that the most likely source of the gas leak was a failure of the White-Rodgers gas control. (*Id.*, Ex. 13 [Boh Dep. at 231].)

iii. Discussion and Conclusion

Although it is not entirely clear from their briefs, it appears that defendants raise two objections to Boh's proffered testimony. First, defendants argue that Boh's testimony should be excluded because Boh did not test the White-Rodgers gas control, nor does he know what specific malfunction or condition caused the gas control to leak. (Def. White-Rodgers' Br. at 9, 19, 21.) Second, defendants appear to argue that, because Boh cannot eliminate the loose "T" fitting or a loose fitting at the piping inlet to the gas

control, his opinion is unreliable.[6] (*Id.* at 9; Def. National Propane's Br. at 8.) I am unpersuaded by either argument.

To begin with, I find that Boh employed a sound methodology in reaching his conclusion, based on his personal experience and training as a fire investigator as well as his observations of the physical evidence present in the Bitler's basement. Also, Boh's inability to determine the specific malfunction in the White-Rodgers gas control is not fatal to the admissibility of his opinion. As plaintiffs state in their response brief, each of plaintiffs' experts present only a portion of plaintiffs' liability theory and none of the experts presents the whole theory. (Pls.' Resp. to Def. White-Rodgers' Br. at 18.) Nowhere in the Federal Rules of Evidence is there a requirement that a single expert witness opine on every scientific fact needed to establish a party's causation or liability theory. Thus, while standing alone,

---

[6] National Propane also stresses the fact that, when Boh first observed the water heater after the explosion, the gas control was in the "off" position. (National Propane Br. at 8.) National Propane maintains that this undercuts plaintiffs' causation theory because, in the "off" position, gas from the main line would not have gotten into the White-Rodgers gas control. (*Id.*) Although I agree that this fact undercuts plaintiffs theory, I do not find it to be dispositive. Boh states that during his inspection he noticed numerous matches at the base of the water heater and the magnitude of the pressure release of the explosion suggests that the most probable source of the gas leak was the White-Rodgers gas control. (Pls.' Attachs. to Resp. to Def. White-Rodgers' Br., Ex. 18 [Boh Supplemental Report].) The presence of matches near the hot water heater supports an inference that there have been problems with the pilot light and lends credence to plaintiffs' contention that someone turned the gas control off following the explosion.

Boh's testimony falls short of establishing plaintiffs' causation theory (and surviving summary judgment) his testimony is not inadmissible under rule 702 or *Daubert* simply because he cannot identify the exact failure in the White-Rodgers gas control. This is a task left for plaintiffs' other experts.

In addition, defendants' argument that Boh's testimony may be unreliable because Boh's inspection revealed a leak in the "T" fitting in the piping near the basement ceiling does not render his opinion inadmissible. The goal of rule 702 is reliability, not absolute certainty.[7] *Orth*, 980 F.2d at 637 (citing *Jones v. Otis Elevator Co.*, 861 F.2d 655, 663 [11th Cir. 1988] ["[A]s long as a logical basis exists for an experts opinion ... the weaknesses in the underpinnings of the opinion [] go to the weight and not the admissibility of the testimony."]) (further citations omitted); *Werth v. Makita Elec. Works, Ltd.*, 950 F.2d 643, 651 (10th Cir. 1991) (holding that expert's theory that defect in circular saw caused accident was admissible because it was based on "clear probability" even thought expert could not identify which of three factual scenarios actually occurred). Moreover, this argument merely challenges Boh's conclusions—an argument in favor of inadmissibility for which *Daubert* offers defendants no support. *Daubert*, 509

---

[7] Boh testified that he believes that the force of the explosion caused the "T" fitting to leak. (Aff. of Thomas Klosowski in Supp. of Mot. for Summ. J., Ex. H [Boh Dep. at 271] [filed July 2, 1999] [hereinafter "Klosowski Aff."].) Boh maintains, that based on his observation of the Bitler basement after the explosion, the force of explosion moved along the basement ceiling and because the "T" fitting was not properly supported, the explosive force caused the "T" fitting to bend, which, in turn, caused the fitting to leak. (*Id.*, Ex. H [Boh Dep. at 254, 271].)

U.S. at 595, 113 S. Ct. at 2797 ("The focus, of course [of a rule 702 inquiry], must be solely on the principles and methodology, not on the conclusions they generate.")

In sum, then, I conclude that Boh's opinion is reliable and would assist the trier of fact in determining the origin of the gas leak that precipitated the explosion that injured Mr. Bitler. Accordingly, Boh's testimony satisfies the admissibility standards set forth in rule 702.

b. Donald Sommer

i. Qualifications

Donald Sommer graduated from the University of Michigan with a bachelor of science degree in mechanical engineering. (Pls.' Attachs. to Resp. to Def. White-Rodgers' Br., Ex. 19 [Curriculum Vitae of Donald Sommer]) He has done graduate work in the fields of instrumentation, testing systems, and cryogenics. (*Id.*, Ex. 19 [Curriculum Vitae of Donald Sommer]) Presently, Sommer is the owner and president of Aerospace, Inc., a company involved in forensic engineering, computer modeling, and failure analysis of airframes, engines, and aircraft systems. (*Id.*, Ex. 19 [Curriculum Vitae of Donald Sommer]) Sommer has engineering experience in mechanical systems design and failure analysis and accident reconstruction. (*Id.*, Ex. 19 [Curriculum Vitae of Donald Sommer]) Also, prior to his involvement in the present case, Sommer has been asked to express his opinion regarding the efficacy of screens and filters in their ability to prevent contaminants from reaching sensitive components in engines and hydraulic systems. (*Id.*, Ex. 14 [Sommer Dep. at 32].)

ii. Sommer's Opinion

Sommer's opinion goes to the heart of plaintiffs' case. Sommer opines that the explosion in the Bitler basement occurred when propane gas ignited after leaking from the White-Rodgers gas control. (*Id.*, Ex. 20 [Donald Sommer

Rule 26 Expert Report]) Specifically, Sommer opines that the leakage in the White-Rodgers gas control was caused by sediment and debris, suspected to be copper sulphide deposits, lodging on the automatic shut-off safety valve sealing surface. (*Id.*, Ex. 20 [Donald Sommer Rule 26 Expert Report at 3).) Sommer believes that the copper sulphide particles bypassed the inlet screen, entered the control, and accumulated on safety valve seat. (*Id.*, Ex. 20 [Donald Sommer Rule 26 Expert Report].) According to Sommer, the inlet screen was improperly designed, allowing particles to pass underneath and around the edges of the screen. (*Id.*, Ex. 14 [Sommer Dep. at 47].) Sommer also believes that the lubricating grease used in the White-Rodgers gas control accumulated on the safety valve seat which helped adhere the copper sulphide particles to the safety valve. (*Id.*, Ex. 14 [Sommer Dep. at 47].)

iii. Discussion and Conclusion

Defendants object to Sommer's proffered testimony (as well as plaintiffs remaining experts) on the grounds that plaintiffs' "phantom particle" theory is unabashed speculation. (Def. White-Rodgers' Br. at 19-20.) Defendants maintain that plaintiffs' theory fails to comply with *Daubert* because it is not based on scientific reasoning or methodology and, therefore, will not assist the jury in determining the cause of the Bitler explosion. (*Id.* at 21-26; Def. National Propane's Br. at 6-16.) Specifically, defendants object to plaintiffs' theory because Sommer did not conduct any controlled laboratory tests on the White-Rodgers gas control safety valve or inlet screen to validate plaintiffs' theory.[8] (*Id.* at 21-25.) Defendants maintain that

---

[8] Specifically, defendants assert that plaintiffs failed to conduct any testing to determine: (1) the size of an obstruction in the

[Footnote continued on next page]

there are too many analytical gaps in plaintiffs' theory and it is built on too many untested assumptions that contradict known facts. (Def. National Propane's Br. at 10-11.) Defendants assert that the lack of any published studies or treatises that support plaintiffs' theory further demonstrates that plaintiffs' theory is not scientifically sound. (*Id.* at 10; Def. White-Rodgers' Br. at 25.) Simply put, defendants argue that plaintiffs' causation theory is the type of "junk science" that the *Daubert* gate-keeping function is designed to keep out of the courtroom. (Def. White-Rodgers' Br. at 25.)

I disagree. Defendants place too much emphasis on a mechanical application of the *Daubert* factors. As the Supreme Court has held, the *Daubert* factors do not represent a single talismanic inquiry fixed for all time. *See, e.g.*,

---

[Footnote continued from previous page]

safety valve needed to cause a leak; (2) how great an accumulation of copper sulphide is necessary to cause a leak; (3) the rate of flow for a gas leak if the safety valve was not fully closed; (4) the ability of a debris to bypass the inlet screen; (5) the force of the safety valve spring when it closes; (6) the ability of copper sulphide to withstand the force of the safety valve spring when it closes; and (7) whether the trauma of an explosion could dislodge particles previously seated on the safety valve. (Def. White-Rodgers Br. at 21-24.) In his supplemental expert report Alan Bullerdiek provided data regarding the leakage rate of gas if the safety valve did not seal properly. Bullerdiek calculated that, if the safety valve was unseated .007 inches (the width of a strip of 35 mm film), gas would leak at a rate of fifty-eight cubic feet per hour; a smaller opening obviously provide less flow. (Pls.' Attachs. to Resp. to Def. White-Rodgers' Br., Ex. 27 [Supplemental Rule 26 Report of Alan Bullerdiek].)

Kumho Tire Co., 119 S. Ct. at 1175 ("We agree . . . that the factors identified in *Daubert* may or may not be pertinent in assessing reliability, depending on the nature of the issue, the expert's particular expertise, and the subject of his testimony.") (internal quotations omitted); *Id.* at 1179 (Scalia, J., concurring) ("[A]s the Court makes clear today, the *Daubert* factors are not holy writ . . . ."). *Daubert* simply requires that "proposed expert testimony must be supported by 'appropriate validation—*i.e.*, "good grounds," based on what is known.'" *Mitchell v. Gencorp, Inc.*, 165 F.3d 778, 781 (10th Cir. 1999) (citing *Daubert*, 509 U.S. at 590, 113 S. Ct. at 2786). A plaintiff need not prove that the expert is undisputedly correct. *Id.* at 781 (citations omitted). As the Third Circuit recently stated: "[t]he test of admissibility [under *Daubert*] is not whether a particular scientific [or technical] opinion has the best foundation, or even whether the opinion is supported by the best methodology or unassailable research. Rather the test is whether the particular opinion is based on valid reasoning and reliable methodology." *In re TMI Litig.*, 193 F.3d 613, 665 (3d Cir. 1999) (citations and internal quotations marks omitted); *accord Mitchell* 165 F.3d at 781-82 ("[T]he plaintiff must show that the method employed in reaching the conclusion is scientifically sound and that the opinion is based on facts which sufficiently satisfy Rule 702's reliability requirement.") (citing *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 [3d Cir. 1994]).

The Supreme Court's concern in *Daubert* and *Kumho* was with the "new" science and novel theories that have not been tested or accepted within their relevant scientific and technical fields.[9] Here, however, the causation theory

---

[9] In *Daubert*, the plaintiffs' children were born with serious birth defects allegedly caused by the mother's ingestion of

[Footnote continued on next page]

plaintiffs espouse is far from novel. To the contrary, the record demonstrates that the problem of contamination of gas control safety valves by particles such as copper sulphide has been known and accepted within the gas control industry for many years. The only arguably novel element of plaintiffs' theory is that this explosion occurred in a White-Rodgers gas control that contained an inlet screen, whereas the majority of previous explosions involved unscreened gas controls.[10]

[Footnote continued from previous page]

Bendectin during her pregnancy. Plaintiffs sought to introduce expert testimony that contradicted the then-existing generally accepted theory that Bendectin is not capable of causing malformations in fetuses. The experts based their conclusions not on human studies, but on: (1) "in vitro" (test tube) and "in vivo" (live) animal studies that found a link between Bendectin and malformations; (2) pharmacological studies of the chemical structure of Bendectin that purported to show similarities between the structure of the drug and that of other substances known to cause birth defects; and (3) the "reanalysis" of previously published epidemiological studies. *Daubert*, 509 U.S. at 583, 113 S. Ct. at 2791. In *Kumho*, the Court wrestled with how to determine the reliability of expert testimony from an engineer who sought to conclude that a manufacturer's defect in a tire caused a blow-out. The Court affirmed the exclusion of the expert's testimony because it involved specific and rather novel theories not generally employed by other tire experts. *Kumho Tire Co.*, 119 S. Ct. at 1178-79.

[10] White-Rodgers vigorously maintains that the evidence which plaintiffs produce concerning accidents involving unscreened gas controls is irrelevant to the instant motion. (Def. White-Rodgers' Reply at 3-4.) I disagree. There is no evidence in the record that the design of the safety valve itself in the unscreened gas controls

[Footnote continued on next page]

With respect to this issue, however, Sommer opines that the inlet screen installed in the Bitler's gas control was "loose and ineffective" and that "black particles had bypassed the screen and entered the control valve." (Pls.' Attachs. to Resp. to Def. White-Rodgers' Br., Ex. 20 [Donald Sommer Rule 26 Expert Report].) To validate his opinion, Sommer compared the inlet screen to White-Rodgers design specifications and concluded that the inlet screen did not conform to the design requirements.[11] (*Id.*, Ex. 26 [Supplemental Rule 26 Aff. of Donald Sommer Re: Resp. to Defs.' Mot. for Summ. J. 117 (hereinafter "Sommer Aff.")].) Specifically, Sommer noted that the inlet screen was not inserted at the correct angle called for in the design specifications and this incorrect angle resulted in irregular edges which allowed debris to circumvent the edges of the

---

[Footnote continued from previous page]

differs from the safety valve in screened gas controls. Therefore, because plaintiffs have come forth with evidence that suggests the screen was ineffective, the evidence of copper sulphide contamination in unscreened gas controls becomes relevant to the disposition of White-Rodgers' instant motion.

[11] White-Rodgers objects to Sommer's supplemental report on the grounds that it introduces new opinions and argues that it should be stricken for violating the scheduling order. (Def. White-Rodgers' Reply at 6-7.) After comparing Sommer's original opinions with his supplemental report, I do not find that Sommer has offered any "new" opinions that were not contained in his initial expert report. I do find, however, that Sommer's inclusion of electromicroscopic photography violates Magistrate Judge Schlatter's order denying plaintiffs' motion to add a metallurgist as a rebuttal expert witness. (Courtroom Mins. [filed July 6, 1999].) Accordingly, plaintiffs electro-microscopic evidence is stricken.

inlet screen. (*Id.*, Ex. 26 [Sommer Aff. 117].) Sommer also states that the inlet screen is approximately .016 inches wide and the slot in which the inlet screen fits is.100 inches wide. (*Id.*, Ex. 26 [Sommer Aff. 116].) Sommer maintains that the result of placing a thin screen in a wide slot creates a passageway for particles substantially larger than the size of the mesh contained in the inlet screen. (*Id.*, Ex. 26 [Sommer Aff. ¶¶ 8, 15, 18].) Sommer's opinion is further buttressed by White-Rodgers' own expert, Rudolph Lambert, who testified that, while checking the effectiveness of the White-Rodgers inlet screens in 1980, he discovered some minor migration of copper sulphide particles around the edges of the inlet screen. (*Id.*, Ex. 12 [Lambert Dep. at 126-27].)

Also, I find that Sommer employed a sufficiently sound methodology in reaching his conclusion. Unlike *Daubert* and *Kumho*, the analytical methodology used by Sommer is based on the application of well-established principles of physics, mathematics, and design engineering. (*Id.*, Ex. 26 [Sommer Aff. 116-7 (explaining how the laws of physics apply to move copper sulphide through the Bitler's gas line)].) There can be no serious doubt that these principles are not generally accepted within the scientific and engineering community. Additionally, there are facts in the record that support the reliability of Sommer's methodology and conclusions derived therefrom. For example, disassembly of the White-Rodgers gas control revealed debris downstream of the inlet screen. Likewise, Sommer states that he observed debris on the safety shut-off valve, the valve seat plunger, and that grease and debris were on the safety shut-off valve seat. Moreover, because Sommer's methodology is sound, his failure to conduct independent testing of the White-Rodgers gas control does not render his testimony inadmissible. *See Orth*, 980 F.2d at 636 (holding that failure to test gas control installed in furnace did not render expert's testimony inadmissible as a matter of law); *Werth*, 950 F.2d at 650-51 (reaffirming view that "otherwise

relevant, factually related expert opinion evidence could support a products liability claim despite the fact that the expert did not conduct independent tests"); *Patterson v. Conopco, Inc.*, 999 F. Supp. 1417, 1420 (D. Kan. 1998) (holding that expert's failure to conduct independent testing goes to the weight the trier of fact should accord the expert's opinion and not to its admissibility) (citations omitted).[12]

Finally, because defendants rely so heavily on it, a few words need to be said about *Stibbs v. Mapco, Inc.*, 945 F. Supp. 1220 (S.D. Iowa 1996).[13] After reviewing the

---

[12] *Orth* involved an gas explosion allegedly caused the failure of a White-Rodgers gas control safety valve installed on a furnace. *Orth*, 980 F.2d at 634. In their lawsuit against White-Rodgers, the plaintiffs' expert theorized that the White-Rodgers gas control safety valve did not close fully because it was contaminated with debris. *Id.* at 635-36. The Tenth Circuit rejected White-Rodgers' claim that the experts testimony should have been excluded at trial because the expert did not conduct testing on the safety valve to verify his theory. *Id.* at 636-37. The court reasoned that the hypothetical nature of the plaintiffs' expert notwithstanding, his theory had a logical and scientific basis based on the circumstantial evidence adduced following the explosion. *Id.* Although *Orth* was decided pre-*Daubert*, and thus not dispositive, I find that the Tenth Circuit's reasoning still has some persuasive value.

[13] Like the instant case, *Stibbs* involved a gas explosion allegedly caused by a White-Rodgers gas control safety valve that did not operate properly. *Id.* at 1221. The *Stibbs* plaintiffs' causation theory was similar in many respects to that proffered by plaintiffs here. *Id.* at 1223. Judge Vietor excluded the plaintiffs' expert testimony under *Daubert* because he found that the experts failed to test certain aspects of their theory which undermined their

[Footnote continued on next page]

Stibbs opinion, I find that, for the purposes of a *Daubert* inquiry, it is distinguishable. For example, the only physical evidence that supported the *Stibbs* plaintiffs' hypothesis was: (1) the presence of a mark on the White-Rodgers gas control safety valve; and (2) the absence of a leak in any other part of the plaintiffs' gas system. *Id.* at 1223. Here, in contrast, Sommer has testified that he observed debris downstream of the White-Rodgers gas control inlet screen and on several parts of the safety valve. Further, the *Stibbs* theory of causation was less refined than that offered in this case. Of particular importance to the *Stibbs* court was the experts' inability to state the origin of the particles that allegedly cause the gas leak or explain how, if the particles came through the gas line, they could have bypassed the inlet screen. *Id.* at 1224. Again, in contrast, Sommer has offered testimony and conducted research into plaintiffs' theory that the inlet screen was inadequate to prevent debris from circumventing the inlet screen. Moreover, it does not appear that the *Stibbs* court had before it the same amount of evidence regarding the gas industry's general acceptance of the theory that gas control safety valves are subject to particle contamination which could render them inoperable. Thus, while this court is cognizant of Sommer's (and plaintiffs' other experts') inability to explain certain facts—most notably the fact that the White-Rodgers gas control worked properly after the explosion—these are issues that go to weight of Sommer's testimony and not its admissibility. *See Daubert*, 509 U.S. at. 596, 113 S. Ct. at 2798 ("Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional

---

[Footnote continued from previous page]

conclusions to such an extent that they were inadmissible. *Id.* at 1223-25.

and appropriate means of attacking shaky but admissible evidence.")

Based on the foregoing, I conclude that Sommer's application of well-established engineering principles to the physical evidence he observed in his investigation of the White-Rodgers gas control provides a sufficiently reliable basis for his opinion. Contrary to defendants' assertions, Sommer is not "expounding on novel scientific evidence, but [] [is] taking known facts, together with his experience and knowledge of causation factors, and drawing a rational conclusion as to causation." *Orth*, 980 F.2d at 636. Any shortcomings in Sommer's opinion and his inability to explain conflicting evidence may certainly affect the weight the jury chooses to give to his opinion, but it does not bar its admission. I further conclude that, because a jury would not have Sommer's knowledge of the behavior of propane gas and design of the White-Rodgers gas control, his opinion will assist the jury in determining a fact in issue. Therefore, because the opinions of Boh and Sommer pass muster under rule 702, summary judgment is inappropriate because a genuine issue of material fact exists concerning causation. Accordingly, White-Rodgers and National Propane's motions for summary judgment are denied with respect to plaintiffs' claims for strict products liability and negligence.[14] Furthermore, because I conclude that

---

[14] In its motion for summary judgment, White-Rodgers requests in the alternative that the court appoint an expert pursuant to rule 706 of the Federal Rules of Evidence or a special master pursuant to rule 53 of the Federal Rules of Civil Procedure to aid the court in determining the causation issues in this case. While the court appreciates White-Rodgers' concern, I believe that this court is more than competent to assess the causation issues raised in this case without outside help. Accordingly, these requests are denied.

summary judgment is inappropriate, I need not consider plaintiffs' remaining experts at this stage of the proceedings.

3. Negligent Misrepresentation

In addition to their negligence and strict products liability claims, plaintiffs assert a negligent misrepresentation claim against White-Rodgers and National Propane. (*See* Notice of Removal, Attach. [Compl. and Jury Demand ¶¶ 34-38 (filed in Denver County District Court on Aug. 14, 1998)].) Colorado law has incorporated the tort of negligent misrepresentation as defined in section 311 of the Restatement (Second) of Torts. *Bloskas v. Murray*, 646 P.2d 907, 914 (Colo. 1982); *CJI-Civ. 4th* 9:3A (1999). The Restatement provides that:

> One who negligently gives false information to another is subject to liability for physical harm caused by action taken by the other in reasonable reliance upon such information, where such harm results (a) to the other, or (b) to such third persons as the actor should expect to be put in peril by the action taken.

Restatement (Second) of Torts § 311(1) (1965).

White-Rodgers argues that it is entitled to summary judgment because plaintiffs have not presented any evidence to support their claim of negligent misrepresentation. (Def. White-Rodgers' Br. at 16.) I agree. Plaintiffs did not even address this argument in their response brief, and my review of the record does not reveal any evidence of White-Rodgers supplying false information concerning its gas control. Thus, while there is a factual issue as to whether the White-Rodgers gas control is defective and unreasonably dangerous or whether White-Rodgers negligently designed and manufactures its gas control, there is no evidence in the record from which a reasonable jury could conclude that White-Rodgers negligently supplied false information

concerning the safety of its gas control. Accordingly, White-Rodgers is entitled to summary judgment with respect to plaintiffs' negligent misrepresentation claim.[15]

4. Conclusion

Based on the foregoing, it is therefore

ORDERED as follows:

1. White-Rodgers' motion for summary judgment (#32) is GRANTED in part and DENIED in part. White-Rodgers' motion for summary judgment is GRANTED with respect to plaintiffs' claim for negligent misrepresentation. It is DENIED in all other respects.

2. National Propane's motion for summary judgment (#35) is DENIED.

3. National Propane's motion for leave to file a reply brief in support of its motion for summary judgment (#56) is DENIED as moot.

---

[15] In contrast to White-Rodgers, National Propane did not specifically move for summary judgment with respect to plaintiffs' negligent misrepresentation claim. Because Nation Propane, as the moving party, has failed to carry its initial burden under rule 56(c) of the Federal Rules of Civil Procedure of showing "an absence of evidence to support the nonmoving party's [claim]," National Propane is not entitled to summary judgment on plaintiffs' negligent misrepresentation claim. *Celotex Corp.*, 477 U.S. at 325, 106 S. Ct. at 2554.

Dated this 3 day of March, 2000.

BY THE COURT:

/s/
EDWARD W. NOTTINGHAM
United States District Judge

APPENDIX C

UNITED STATES COURT OF APPEALS

TENTH CIRCUIT

FRED D. BITLER; PEGGY A. BITLER; COLORADO COMPENSATION INSURANCE AUTHORITY, a political subdivision of the State of Colorado,

Plaintiffs – Appellees,

v.

A.O. SMITH CORPORATION, a foreign corporation; NATIONAL PROPANE CORP., formerly known as All Seasons Propane, a Colorado corporation,

Defendants,

and

WHITE RODGERS, a subsidiary of EMERSON ELECTRIC CORP., a foreign corporation,

Defendant – Appellant.

No. 02-1527

ORDER
Filed February 9, 2005

Before **LUCERO, McKAY** and **HARTZ,** Circuit Judges.

Appellant's petition for rehearing is granted for the purpose of clarifying our language. The revised opinion is attached.

The petition for rehearing en banc was transmitted to all of the judges of the court who are in regular service as required by Fed. R. App. P. 35. As no member of the panel and no judge in regular active service on the court requested that the court be polled, that petition is denied.

Entered for the Court
Patrick Fisher, Clerk

By: /s/
Deputy Clerk